SECTION 7
SEWAGE PUMPING STATIONS

7.1 GENERAL

7.2 DESIGN STANDARDS

SECTION 7
SEWAGE PUMPING STATIONS

7.1 GENERAL

7.11 This section includes the general requirements for the design criteria and installation of sewage pumping stations.

7.12 The relevant provisions included in these specifications shall be applicable to this section, unless otherwise indicated herein or approved by the City.

7.2 DESIGN STANDARDS

7.20 Reference

The Developer shall comply with the applicable regulations established by the Florida Department of Environmental Protection. Additionally, the criteria provided in the Recommended Standards for Wastewater Facilities, Latest Edition, and WEF Manual of Practice No. 9, Latest Edition, may generally be utilized as design guidelines, if not in conflict with state, county, city, or other regulatory agency requirements. See typical City of Leesburg submersible lift station design drawing attached.

7.21 Design Flows

Sewage pumping stations shall be designed for the total ultimate development flow from all contributory areas. The design average daily flow shall be computed at the unit rates set forth under Section 5. The maximum required pumping capability shall be the product of selected peak factors times the accumulative average daily flow (ADF) from the total service area. In general, the following factors shall be applicable for the range of flow contributions indicated (million gallons per day average daily flow: MGD - ADF), unless larger values are required or smaller amounts are justified, with prior approval from the City.

Flow Range	Peak Factor
0.00 to 0.05 MGD-ADF	3.5 to 4.0
0.05 to 0.25 MGD-ADF	3.0
0.25 to 2.00 MGD-ADF	2.5

Note: Special analysis shall be made for flows beyond 2.00 MGD-ADF and peak factors less than 2.5.

7.22 Pump Selection

A) For pumping stations with a peak flow demand of 1,000 gallons per minute (GPM) or less, a minimum of two pump units shall be provided (with one (1) pump operating to meet peak flows, and one (1) pump on standby). Where the peak design flow exceeds 1000 GPM, three or more units shall be included in the facility (with two(2) pumps operating to meet maximum demand and one (1) pump on standby).

B) The selected sewage pump system shall have the minimum capability of pumping the design peak flow at the maximum computed system total dynamic head (TDH)

requirements.

C) Head-Capacity curves shall be prepared for the proposed pumping system in order to determine the various operational conditions. Hydraulic computations shall be in accordance with good engineering, practice, with pipe friction loss calculated by the "Hazen-Williams Formula", using standard friction factors based on the materials utilized.

7.23 Wet Well Design

A) The wet well structure shall provide a minimum capacity between operational water levels sufficient to allow a minimum of five (5) minutes between successive starts of the pumps, when the effluent rate is one-half the maximum one pump capacity. Low water levels shall provide adequate submergence to preclude pump inlet vortexing, air binding or other design considerations. Operational maximum high water levels shall not exceed the invert elevation of the lowest influent pipe, with high water alarm no higher than the 0.8 of said pipe. A minimum size hopper bottom shall be provided, with the wet well floor sloping to said bottom at a slope of not less than one to one (1/1). Additionally, where the wet well extends below the ground water table, the structure shall be designed to eliminate any possibility of flotation.

B) Odor control shall be provided as required and specified by the City utility department for remote stations and/or areas of low flow, at the discretion of the Director of Environmental Services.

C) All capital lift stations shall be provided with a cast in place HDPE liner.

7.24 Station Water System (Non-Potable)

All sewage pumping stations shall be provided with a station water system, with adequate capacity and pressure, for washdown or other requirements. Said supply shall be completely separated from the potable supply by use of a Conbraco reduced pressure type backflow preventors or other City approved protective systems. Backflow device shall be tested by a certified tester within five days of installation, with written results provided to the City.

7.25 Emergency Power Provisions - Generators and Emergency Power Connections

It is in the best interests of the public to maintain uninterrupted wastewater flow even during periods of commercial power outages. Therefore, any lift station with a design wastewater flow of 250 gpm or greater will be provided with an onsite standby, diesel, power generator and automatic transfer switch as further detailed in Section 7.26 F. In addition, at the discretion of the Director of Environmental Services, any proposed station that is located in a remote area, or area located at a considerable distance from the Environmental Services Offices, may be required to be equipped with an emergency generator.

Any other lift station not falling onto the above criteria shall be equipped with standby power generator connections for emergency auxiliary pumping. Standard generator plugs shall be as follows:

All 240 V, 3PH plugs shall be Russell Stoll Model #JRS2044FR
All 480 V, 3PH plugs shall be Russell Stoll Model #JRS2044MR
All 240 V, 1PH plugs shall be Russell Stoll Model #JRS1044FR

7.26 Sewage Pumps, Motors, and Standby Generators

A) Sewage pumping units shall be capable of handling raw, unscreened sewage and shall be capable of passing a sphere of at least 3 inches in diameter. Pumps shall be electric motor driven and of a proven design that has been in sewage service under similar conditions for at least five years.

Pumps shall provide the required peak design performance requirements and be suitable for operation within the total hydraulic range of operation. See attached drawing. Pumps shall be as manufactured by Hydromatic.

B) Pump Motors

Pump motors should be non-overloading, excluding service factor, throughout the entire operating range of the pumps. Two or more normally closed heat sensing miniature switches connected in series and embedded within the motor windings shall be provided to shut off power and initiate alarm light for motor over-temperature condition. See attached drawing.

C) Pump Controls & SCADA System

See Section 8 of these specifications for information on the Pump Control and SCADA combo control panel.

D) Submersible Pump Facilities

Installation shall include the removable pump units, aluminum access frame and cover, stainless steel pipe pump guide bars, pump discharge connection and other necessary appurtenances. The submersible pumping system and accessories shall be as manufactured by Hydromatic. See Standard Drawing for submersible lift station. Also provide a 3" camlock quick coupling for emergency by-pass at pumping stations.

E) Factory Built Facilities

Factory built facilities shall have prior City approval before inclusion in plans.

F) On-Site Standby Generator

See Section 9 of these specifications for information on Standby Generators for Lift Stations.

7.27 Valves

A) Valve Vaults

Valve vaults must be a minimum of 6 feet by 6 feet (inside dimension), with no less than 12 inches from the side wall to the valve clearance. Vault must be coated, with Inextol epoxy inside and outside with a finish coat of 32 mils. All metal on the inside of the valve vault shall be coated with Inextol Epoxy and will also have a finish coat of 32 mils. See attached drawing.

B) Valves

All valves used in station valve boxes shall be DeZurik or Clow, 100% full flow plug valves. Any valve 8 inches or over must be gear operated.